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AUTHOR	Graeml, Alexandre Reis; Ehrlich, Pierre Jacques
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ABSTRACT

This paper establishes a comparison between the problems that IT (Information Technology) people are currently having in evaluating the return on the investment in IT and the difficulties faced by those who have been trying to find consistent ways of assessing the benefits of formal education since the 1960s. The objective was to determine if the problems in assessing investments in the area of education were the same or similar to those in the IT area. If that were the case, there would be room for future studies to determine if "education economics" could contribute to the development of better evaluation tools for investments in IT. The first section discusses coincidences and similarities between the benefits from IT and the benefits from formal education, including: IT and formal education are power decentralization and opportunity democratization factors; IT and education allow/happen in less hierarchical environments; and IT and education are important flexibility factors. Difficulties involving the investment in IT and formal education are addressed in the second section, including: depending on the industry, the impact of the investment may vary greatly; and difficulty in isolating the benefits directly related to the investment in education or in IT from those caused by other factors. (MES)

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ASSESSING THE VALUE OF IT (AS DIFFICULT TO ASSESS AS THE VALUE OF FORMAL EDUCATION?)

Alexandre Reis Graeml
Centro Federal de Educação Tecnológica do Paraná - Brazil (CEFET-PR)
Centro Universitário Positivo - Brazil (UNICENP)
e-mail: graeml@dainf.cefetpr.br

Pierre Jacques Ehrlich
Escola de Administração de Empresas de São Paulo - Brazil (EAESP-FGV)
e-mail: ehrlich@eaesp.fgvsp.br

Abstract: This paper tries to establish a comparison between the problems IT people are having, at the end of this century, to evaluate the return on the investment in IT, and the difficulties faced by those who have been trying to find consistent ways of assessing the benefits of formal education since the 60's. Our objective was to check if the problems in assessing investments in the area of education were the same, or similar to those in the IT area. If that was the case, there would be room for future studies trying to determine if the Education Economics could, somehow, contribute to the development of better evaluation tools for investments in IT.

Key-words: information technology, formal education, value assessment

"Invest in education because the cost of preserving our future
is nothing compared to the cost of not having one."
Joe Petterle (1991)

Introduction

Not only academic literature but also computer industry advertising, is full of impact statements like the one above. However, it's a relief to realize that such statements are not the sole property of the computer arena. The statement above relates to the educational field, though it would be well suited to our techie environment if we swapped the word *Education* with *Information Technology* and rephrased the sentence a bit to better suit corporate "ears": "*Invest in IT, because the cost of preserving the future of your enterprise is nothing compared to it not having one*". Perfect!

When we started studying the impact of Information Technology on organizations (and the subsequent value of IT), we thought it would be interesting to investigate other areas with similarly intangible benefits. If we were able to identify another area with the same characteristics and with good, established assessment procedures, we could possibly spare ourselves a lot of effort and time. We thought of an old Portuguese saying: "When the brains don't think, the body has to work twice as much". As we didn't want to "work twice as much", we started looking for studies in other fields of knowledge that could complement or bring new insights to the way people have been treating the intangibles related to the

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investment in IT. It would be quite an achievement if we could shed some light onto IT research pertaining to the value of technology to organizations. The only thing researchers had been able to say so far is that IT really brings a lot of intangible benefits to those who invest on it - benefits which probably far surpass those easily quantifiable.

Curiously, the first areas that came to mind, when we started thinking about the evaluation of intangible benefits - Education, Health, Quality of Life, Tourism, etc. - are all areas related to people, rather than to machines. This only reinforces another idea that has been discussed lately: we have to pay more attention to people and their capabilities, rather than letting them be overshadowed by the *glamour* of the technology. The value of technology is not inherent to the technology itself, but is directly related to its capacity to make people more efficient and productive, individually or in their teamwork.

This paper tries to establish a comparison between the problems IT people are having, at the end of this century, to evaluate the return on the investment in IT, and the difficulties faced by those who have been trying to find consistent ways of assessing the benefits of formal education since the 60's. Our objective is to check if the problems in assessing investments in the area of education are the same, or similar to those in the IT area. If that is the case, there is room for future studies trying to determine if the *Education Economics* can, somehow, contribute to the development of better evaluation tools for investments in IT. To quote another popular saying, "we wouldn't need to reinvent the wheel", and our efforts could be focused on "improving other parts of the car".

Coincidences and similarities between the benefits from IT and the benefits from Formal Education

IT and Formal Education are power decentralization and opportunity democratization factors:

In 1963, Schultz (apud CARNOY, 1995a), identified in Education the capacity to change salary structure and payment for work, altering the value relationship between capital and work, favoring work. This could represent a conflict of interests, as the owners of capital could be little interested in having part of their power redistributed among other people.

As IT makes the access and use of information easier to a larger number of people, it also affects the power relations within organizations, requiring special attention to be paid to managing conflicting interests.

Education and IT promise to act as power and income dissipators (which can provide an important social benefit), but this can also be a source of resistance by those who feel to be disadvantaged by it.

IT and Education allow/happen in less hierarchical environments:

Another interesting feature of the educational process and the new activities supported by the use of computers is that, in schools and "information era" organizations, there is no strict hierarchical structure, like the one that predominates in "industrial era" enterprises. Teachers and professors are not usually supervised in their activities. There isn't even a formal contract specifying the results expected from the "processing" of the student by the school. Teachers are assigned responsibility and it is expected that they put their best

efforts into conveying their knowledge to their pupils. The "information era" organizations also tend to be hierarchically less strict than those production-line companies of the "industrial era", assigning more responsibility and expecting, on the other hand, more dedication, creativity and initiative from their employees. SAS's Jan Carlzon once said: "A person without information can't assume responsibility. With information, he can't avoid it" (NAISBITT, 1990).

IT and Education are important flexibility factors:

The world is changing faster than ever. Schultz (apud CARNOY, 1995a) wrote in 1975, that one of the benefits of formal education was that it improved the ability to adjust to changes and adopt new forms of doing things. For CARNOY (1996), there has been a major swing in the purpose of education: in the past, the educational process focused on conveying certain skills, necessary for the execution of specific tasks; today, people have to be prepared quickly, and with great flexibility for tasks that are not very clear and which will undoubtedly change more often and more quickly than ever before. Reusable skills should be developed - particularly those skills that facilitate adjusting to change, interacting and problem solving. In the case of education, flexibility seems to mean give people a relatively high level of cognitive knowledge, which makes learning other tasks easier. In the case of IT, organizations expect their investment in technology to make them more able to adapt to the fast and radical changes in their business environment. Such flexibility should contribute to ever smaller production batches and lead times. Ultimately, IT should provide the industry with the main feature, lost since the time of handicraftsmen: exclusive/customized production (only possible by the close and intense interaction with customers). In times of radical change, flexibility is the key to the success, or even the survival, of organizations, it being the product of well educated people, capable of adapting to and generating change, or of the creation of a new technological model, free from the paradigm of serial production in large quantities and focused on satisfying the individual needs of each customer.

Difficulties involving the investment in IT and Formal Education

Depending on the industry, the impact of the investment may vary greatly:

One major difficulty related to the evaluation of investment in education, as well as in IT, is the fact that the impact of investment is also a function of the environment in which it occurs. CARNOY (1995b) states that the relationship between education and productivity varies significantly from one industry to another.

The intensity of the need for IT also varies widely from sector to sector depending, to some extent, on the level of competitiveness within the particular industry, but also on the productivity gain technology can provide companies with. A good example of this is the banking industry, which is highly dependent on the electronic management of information, and the construction industry, in which the impact of IT is much smaller.

Difficulty in isolating the benefits directly related to the investment in education or in IT from those caused by other factors:

Another problem is that, unfortunately, there is no practical way of segregating the benefits caused by formal education from those caused by other factors, such as the influence of the family (schooling level, social status, etc) among others, which are highly interconnected. The differences among people with different schooling profiles cannot be uniquely assigned to their educational experience. This makes it difficult to come to any conclusion about the impact of schooling. SOLMON (1995) argues that, regardless of what happens in the ideal world of research in the social sciences and education, it is impossible to study two identical groups, one exposed to formal education and the other not. For him, attempting to use statistical control in studying the issue is problematic in that one will never be sure one is taking all important factors into account, as many of them may be impossible to measure or even to imagine.

The same kind of difficulty happens when we try separating the influence of IT from that of other factors that are simultaneously acting on organizations. This makes it impossible to assign the majority of benefits related to the investment on IT exclusively to such investments. There is always a reasonable level of subjectivity involved, which allows for different interpretations, depending on the issue one is trying to prove.

Conclusions

Economists must understand the educational process, as well as the new ways of organizing work and the new technologies being introduced. In order to do this, it is necessary to create new, more complex models than those bound by the familiar paradigms of the "industrial era" which have hitherto been used to understand production line processes.

Formal education and the new ways of work organization, made possible by IT, are elaborated processes, which require special attention in their evaluation. Education and the implantation of IT are closely related to changes in attitudes and, as such, are not immediate processes. Ways of thinking as well as values cannot be quickly modified, as a consequence of scenario changes or competitive pressures. Therefore, **investment in education and investment in IT are both part of long term strategies. Consequently, any attempt to measure their results should be carried out with a long term vision**.

For CARNOY (1995c), the benefits of formal education go far beyond improving an individual's performance. Higher schooling does not only make people more productive themselves, but also allows them to help others become more productive. Thus, formal education benefits the whole community, contributing to the improvement of health conditions, decreased criminality rates, etc.

SOLMON (1995) notices that there are several beneficiaries of the educational process: the students, the community and the teachers and other workers in the education industry. All of them have to have their interests evaluated.

BENJAMIN (1993) recognizes that, as in the case of education, there are several agents benefiting (or not) from the investment in IT. They also need their interests to be well understood. He suggests that the level of commitment to the success of the investment is contingent on each one of those who have a role in the change process. Their capacity to interfere in the process, their availability, their gains from or resistance to the change should be evaluated. The identification of all stakeholders and their involvement in the change process is crucial to the chances of success of the investment in IT in achieving the expected benefits. The energy required to support the change process comes from the organization's

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capacity to satisfy its needs and aspirations. Therefore, it is important that the change process is supported by a sufficient number of people committed to its success.

From what we have discussed above, it is clear that the strategic investment in IT and formal education have several things in common. The reasons for investment can be the same, especially when the focus is on achieving greater flexibility, which is probably why organizations are starting to discuss strategic IT investments, training and education and organizational culture at all. Difficulties with the intangibility of benefits and the time taken (usually long term) also seem to be similar in nature. This makes us wonder if "education economics", which has been around for much longer, couldn't help in the development of "information economics", now.

But CARNOY (1995a) reminds us that things are not going to be that simple, and that we shouldn't get too enthusiastic. He says that, up to now, there is no evidence that increased, more formal education enhances productivity. We only know that there is a strong correlation between more schooling and higher salaries. Researchers like Carnoy only believe that when school increases the student's cognitive knowledge, it makes him/her potentially more productive, as such knowledge is important for him/her to develop the special skills necessary to perform his/her work more efficiently. In other words, although they have been trying to measure the importance of education for almost four decades, by now, they are still conjecturing about the real value of education, and still have a long way to go.

If, despite all research already developed on *education economics* since the 60's, nobody can yet establish a definitive relationship between schooling and productivity, maybe we should be a little more patient, when we struggle for answers for the evaluation of strategic investment in information technology.

This shouldn't be taken as a reason for discouragement, just that we should be conscious there is still a lot of work ahead of us, before we do have a solid theoretical ground on which to step when looking for conclusive assessments of strategic IT investment. Until then, "mind and body will have to work ceaselessly", regardless of the Brazilian adage!

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